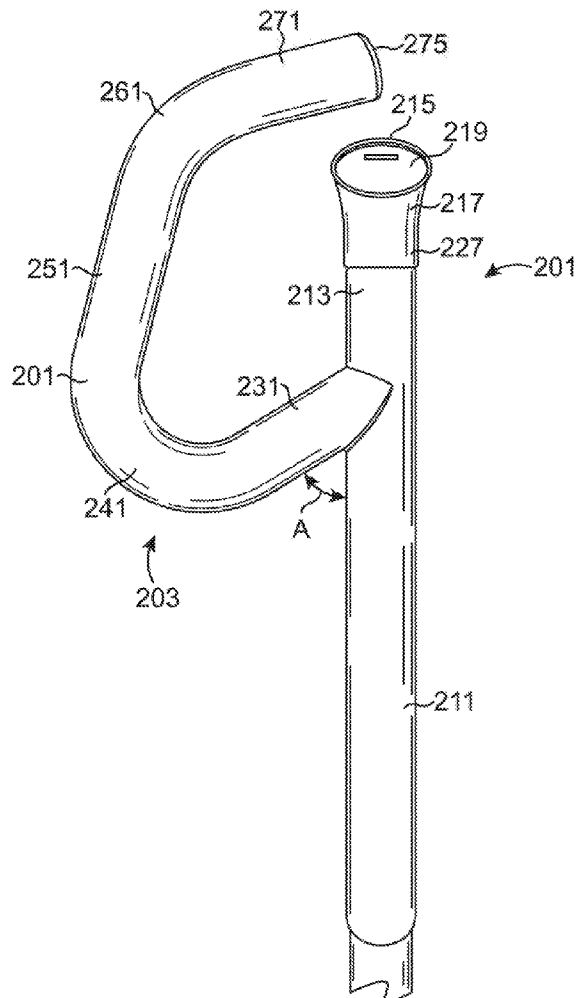




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Mueller et al.(10) **Pub. No.: US 2016/0263426 A1**(43) **Pub. Date: Sep. 15, 2016**(54) **OPEN HANDGRIP FOR AN EXERCISE MACHINE***A63B 22/06* (2006.01)*A63B 24/00* (2006.01)(71) Applicant: **True Fitness Technology, Inc.**,
O'Fallon, MO (US)(52) **U.S. Cl.**
CPC *A63B 21/4035* (2015.10); *A63B 24/0087*
(2013.01); *A63B 22/001* (2013.01); *A63B*
22/0664 (2013.01)(72) Inventors: **Thomas L. Mueller**, St. Charles, MO
(US); **Robert John Hawthorne**, Troy,
MO (US)(21) Appl. No.: **15/068,037**(57) **ABSTRACT**(22) Filed: **Mar. 11, 2016****Related U.S. Application Data**(60) Provisional application No. 62/131,484, filed on Mar.
11, 2015.**Publication Classification**(51) **Int. Cl.**
A63B 21/00 (2006.01)
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A handgrip which has two terminating ends that does not connect with the other components to form a closed loop but instead form an open loop in the form of a "C", inverted "C", "U", or inverted "U" depending on the side of the exercise machine the grip is to be used on and the manner of viewing it. This is commonly referred to as an open structure as this provides for a handgrip which does not fully circumscribe an area. It only partially circumscribes an area and creates a structure with two terminating ends on each handle.



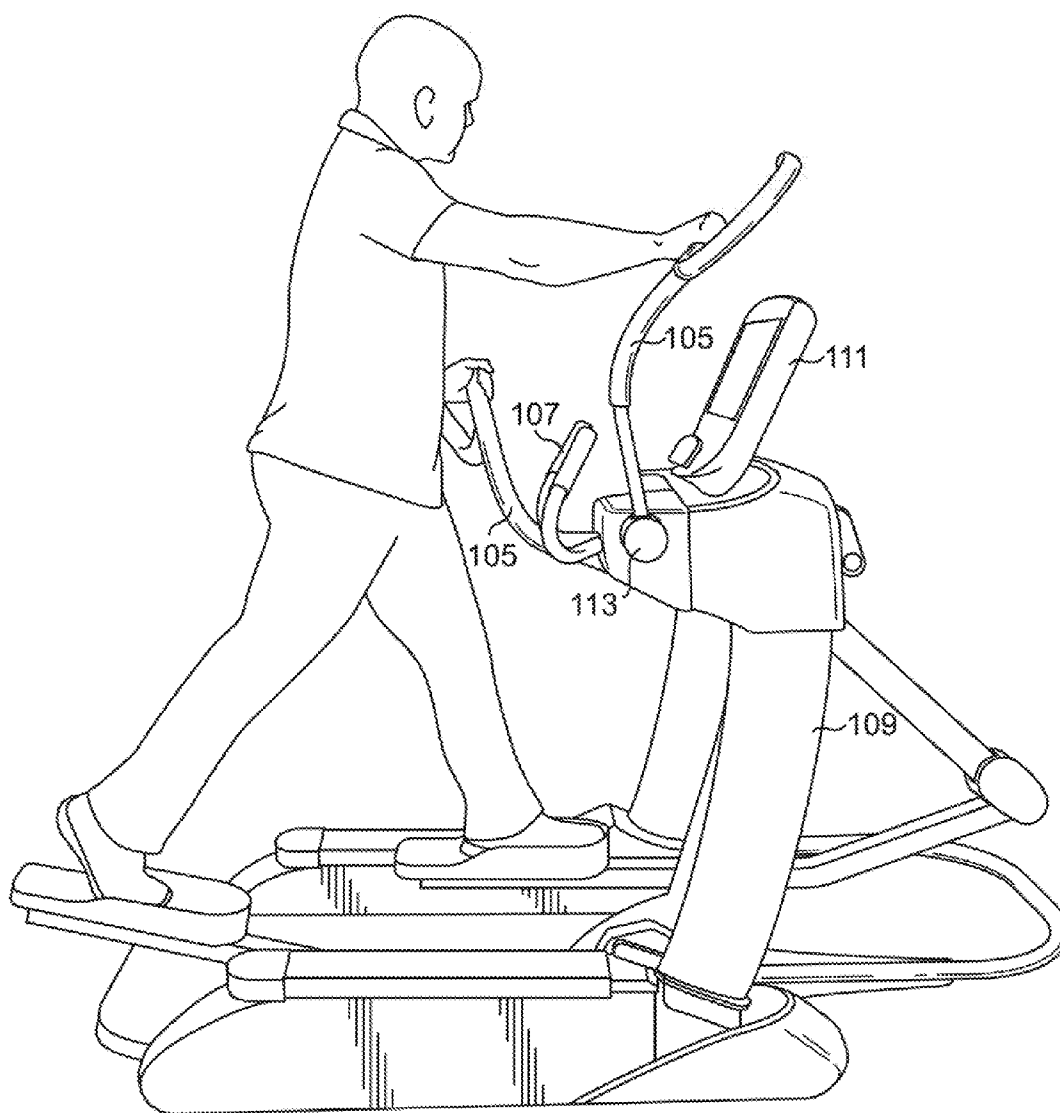


FIG. 1

FIG. 2

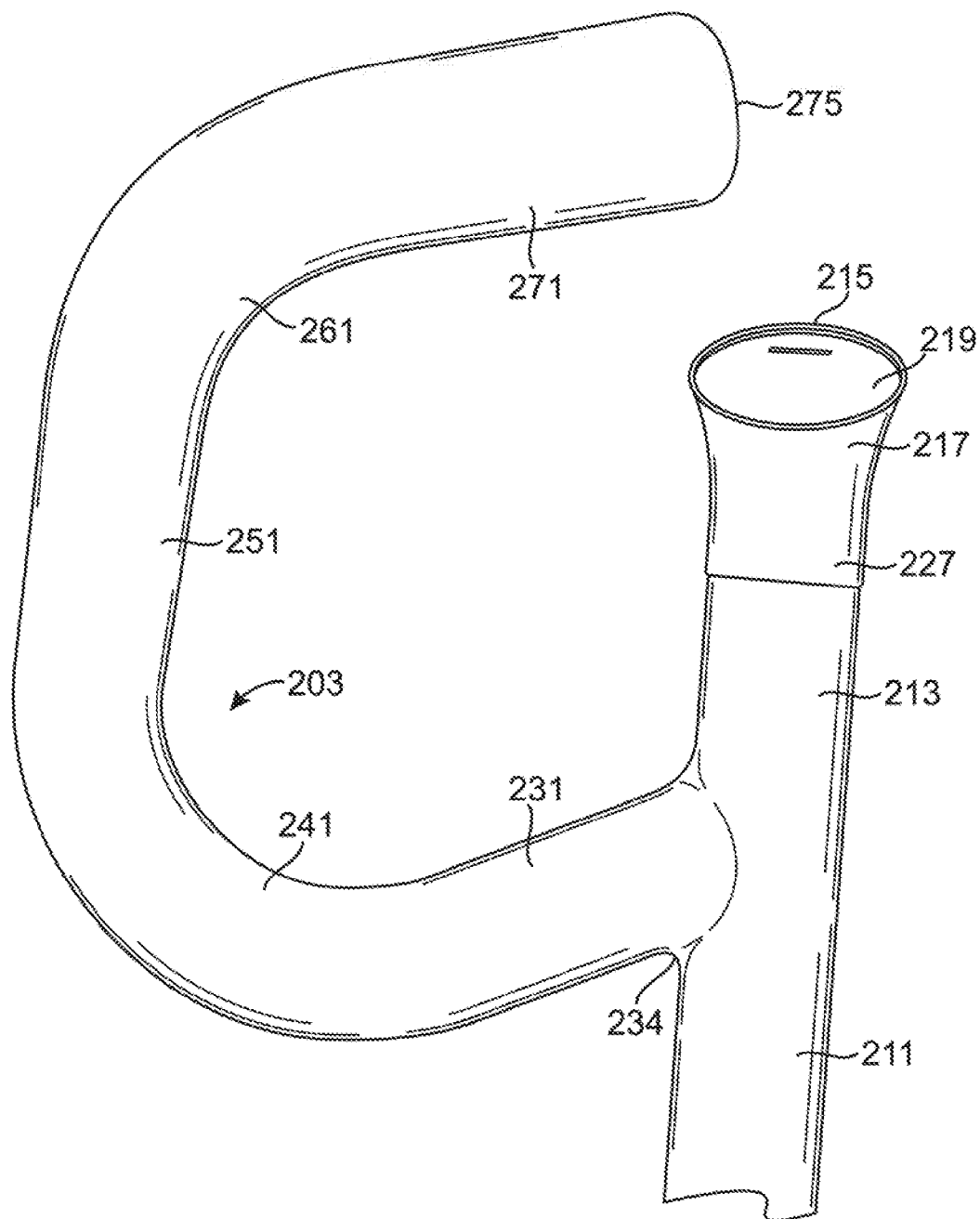


FIG. 3

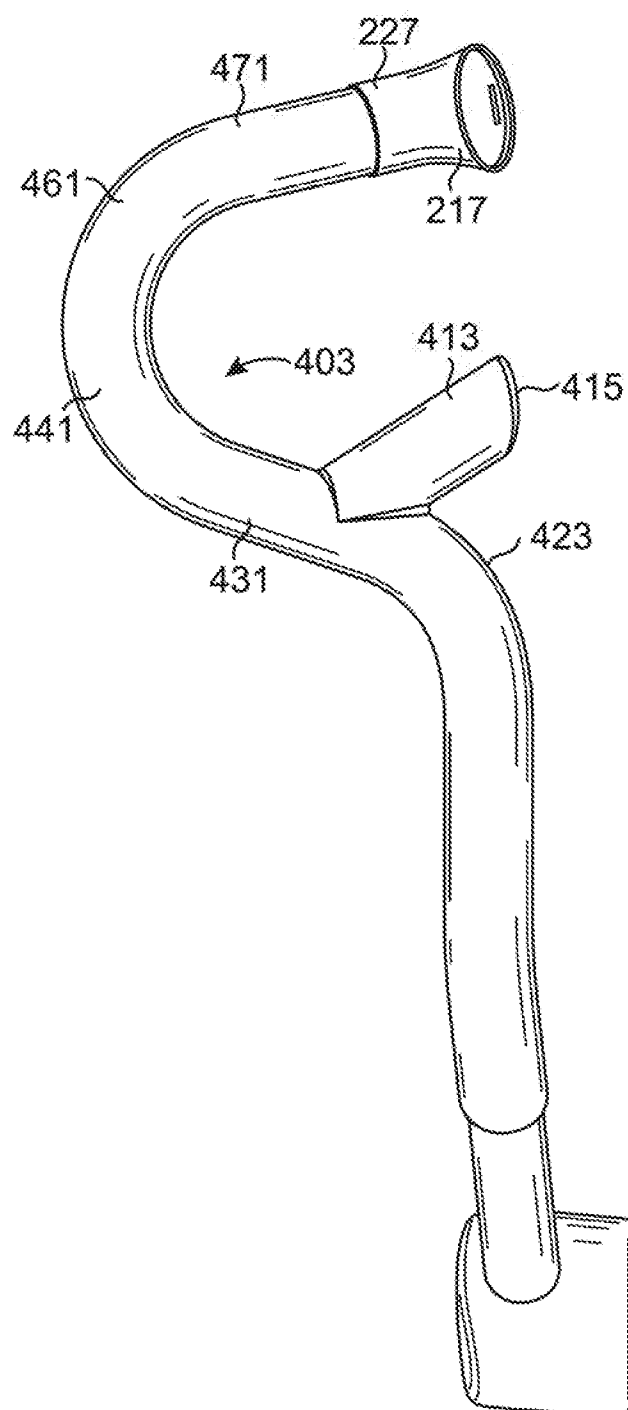


FIG. 4

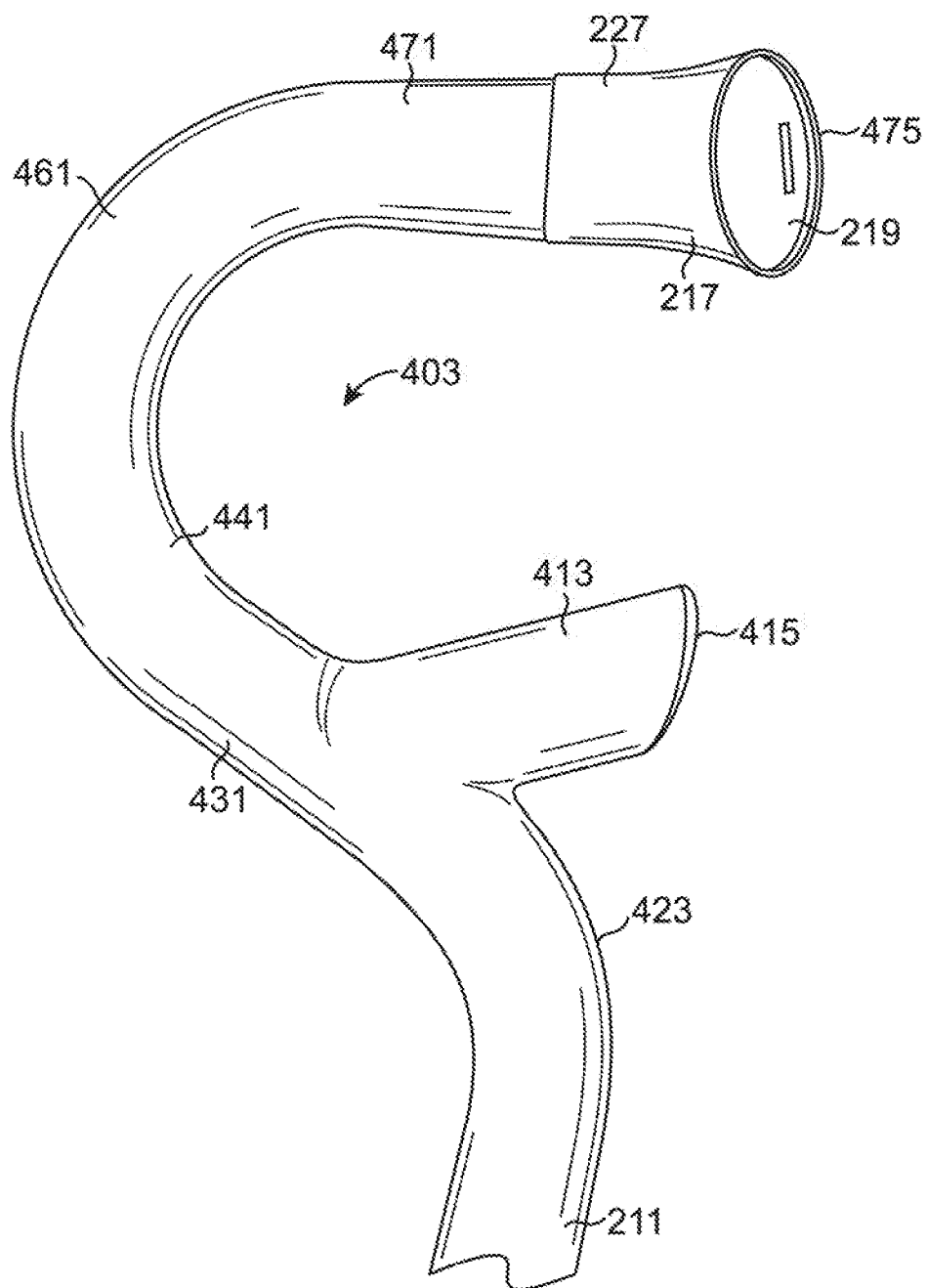


FIG. 5

FIG. 6

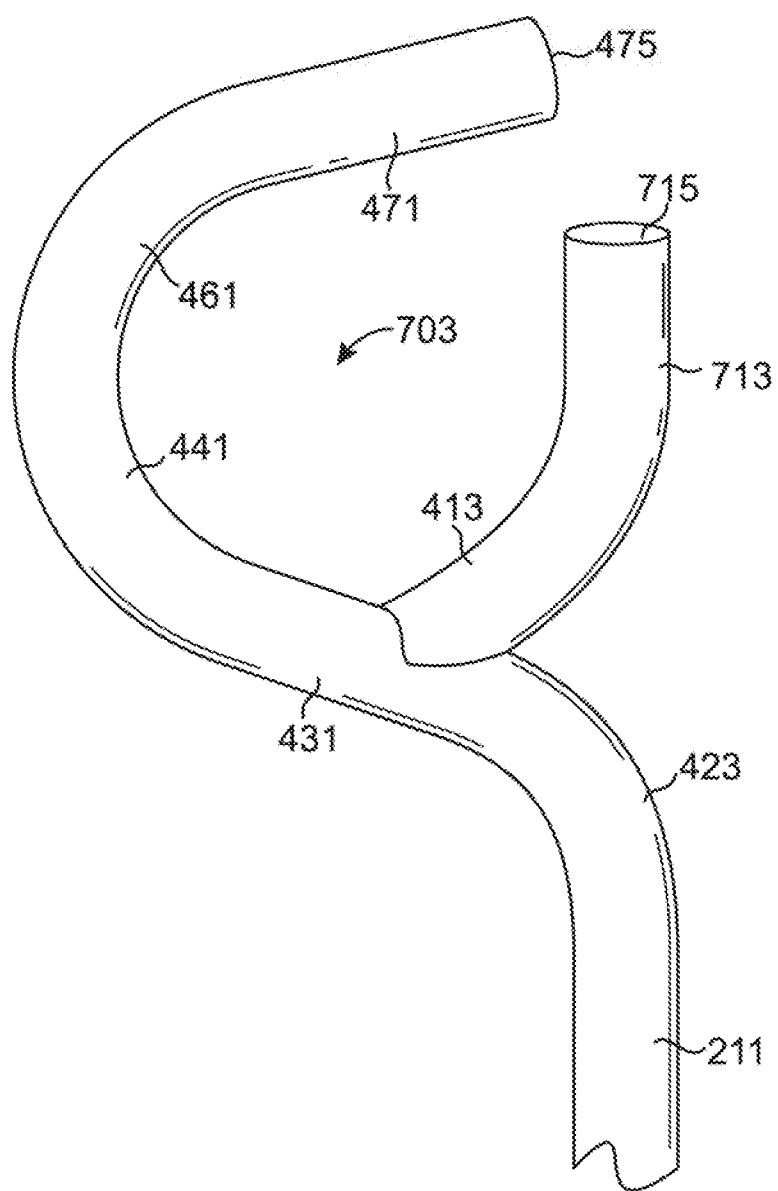


FIG. 7

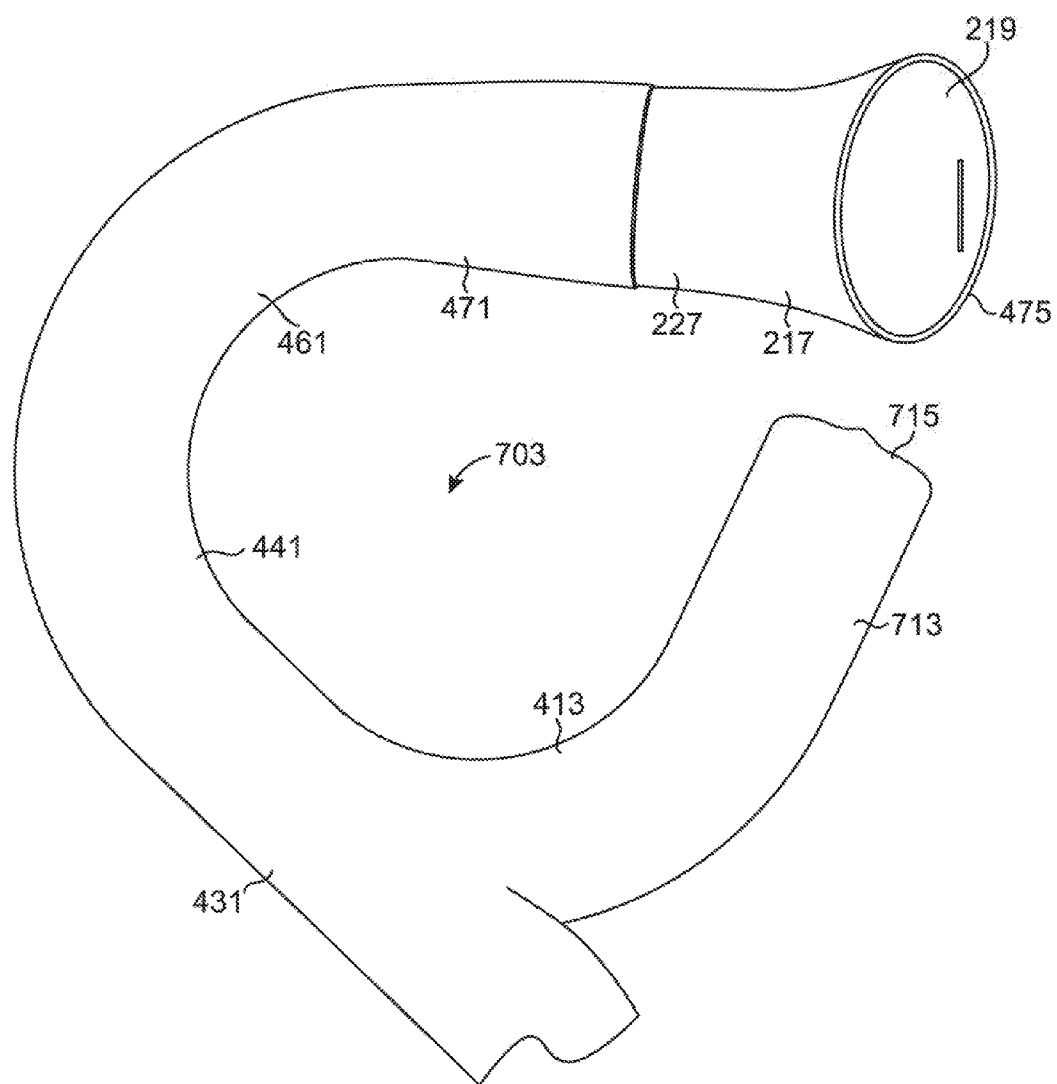


FIG. 8

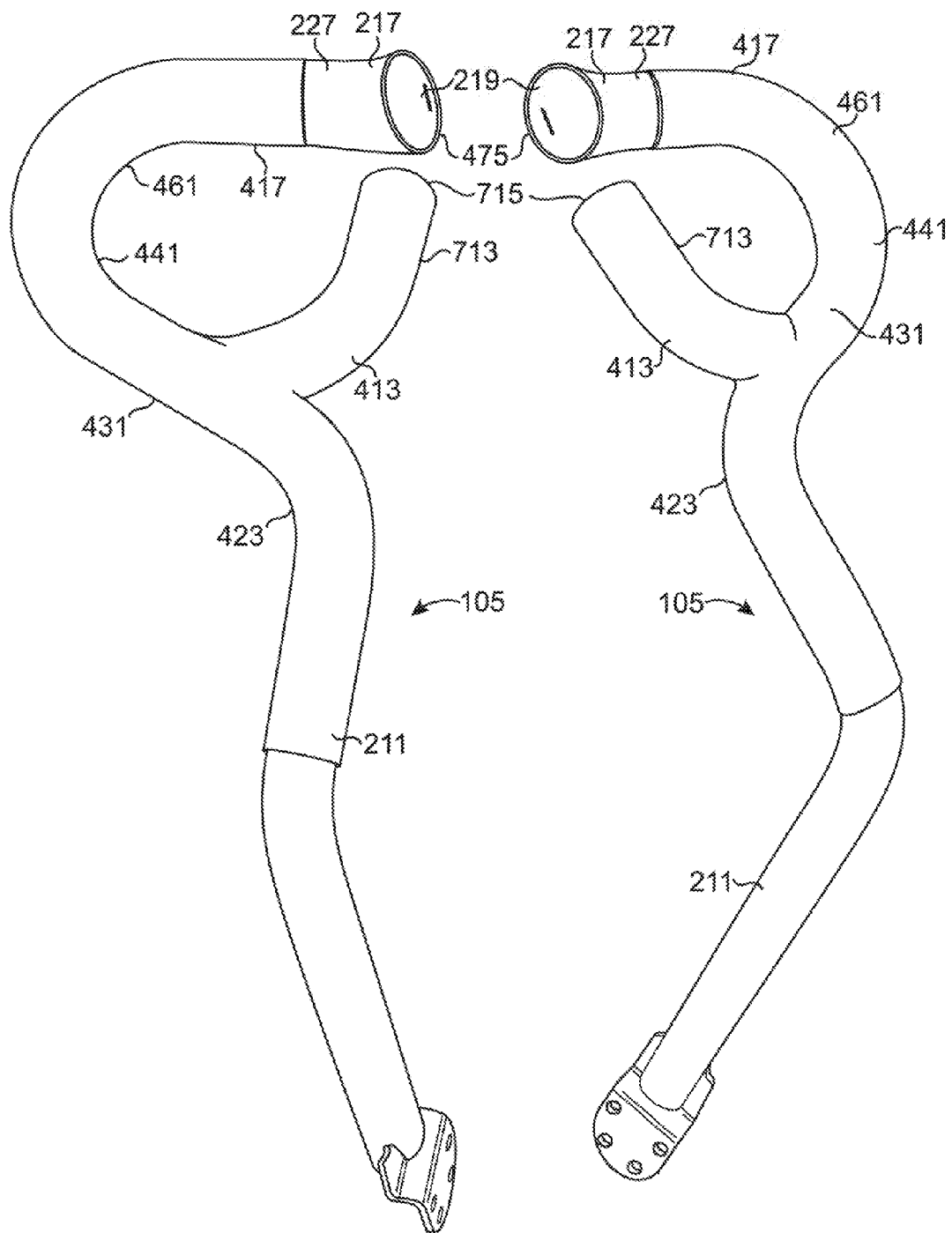


FIG. 9

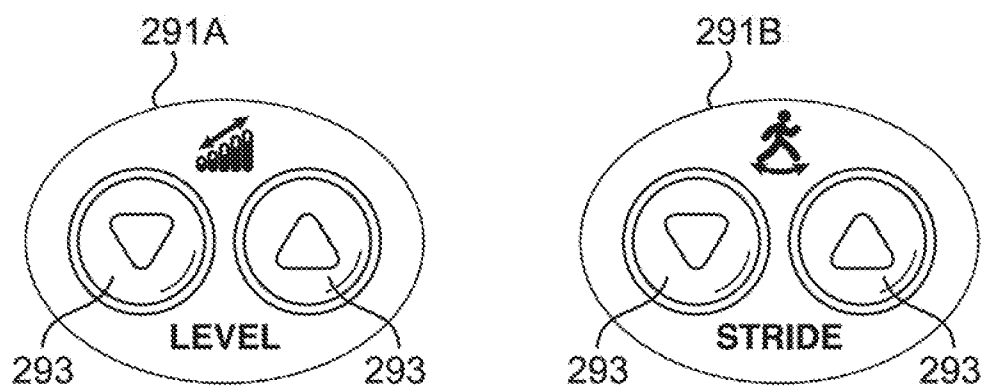


FIG. 10

OPEN HANDGRIP FOR AN EXERCISE MACHINE

CROSS REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No.: 62/131,484, filed Mar. 11, 2015, the entire disclosure of which is herein incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This disclosure relates to the field of arms and handgrips for cardiovascular exercise machines. In particular, to handgrips which include mounted controls and an open grip design.

[0004] 2. Description of the Related Art

[0005] The benefits of regular aerobic exercise for individuals of any age is well documented in fitness science. Aerobic exercise can dramatically improve cardiac stamina and function, as well as leading to weight loss, increased metabolism and other benefits. In order to allow people to perform aerobic exercises without having to go outside or to large sports complexes, fitness machines have been developed to allow a user to perform aerobic exercises in fitness centers or a small area of their home.

[0006] Exercise machines that are designed to be used when the user is standing upright are commonly categorized into three major groups. The first of these is treadmills, where a user walks or runs on an endless conveyor belt. Treadmills are generally the most common form of cardio exercise device as they are simple to understand and operate and they provide for a very natural exercise motion. The second classification is a stair stepper. Stair steppers are designed to provide the user with a significantly vertical movement simulating climbing stairs. This can be performed through the use of a specially shaped treadbelt, or through the use of vertically actuated footpads. The third type of device is an elliptical exerciser.

[0007] The elliptical exerciser (also known as an “elliptical machine”, “elliptical cross-trainer”, or “glider”) have become very popular due to their ease of use and their provision of relatively low-impact aerobic exercise. Generally in these types of machines, a user performs a motion using their legs which forces their feet to move in a generally elliptical, race-track, oval, or elongated circular motion about each other. This motion is designed to simulate the motion of the feet when jogging, walking, or climbing but the rotational motion is “low-impact” compared to jogging or climbing where the feet regularly impact a surface.

[0008] In an elliptical machine, the user’s feet do not leave the footpads of the machine in most cases and the footpads smoothly travel through a defined path reducing or eliminating impacts from the user’s feet striking the surface. In many respects, the motion could be considered more akin to a pedaling motion than a walking motion, but because the exercise is performed standing up, and with an elongated elliptical motion as opposed to a circular pedaling motion, the motion feels more like a striding walk, ski, or “glide”.

[0009] Regardless of the type of cardiovascular machine used, these machines traditionally function to exercise the user’s cardiovascular system through exertion of the skeletal muscles of the lower body, but do not exercise the upper body

to any significant extent. Recently, however, cardiovascular machines of this type have begun to adopt moveable arms and handgrips whose motion is interlinked with the motion of the user’s feet. Pushing and pulling on these arms often goes hand in hand with the user having to move their feet on the machine providing an upper body exercise. This type of full body exercise is particularly valuable on elliptical machines, stair steppers, and unpowered treadmills where the motion of the user’s feet usually serves to provide the motion to the user. Essentially, in these machines, the user’s motion serves to drive the machine. This is different than in powered treadmills where a motor turns the belt and the user is forced to walk or run to avoid being pushed off.

[0010] These upper body exercise systems have traditionally used arm members which are independently moveable against the resistance of a spring or friction plate in a swinging motion to provide for an upper body workout in conjunction with the cardiovascular and lower body workout while still providing a fairly natural movement. However, more modern versions operate the arms in conjunction with the movement of the feet where movement of both the upper and lower body is interlinked and serves to drive the same ultimate components of the machine. Thus, the two parts of the body work together to drive the machine.

SUMMARY OF THE INVENTION

[0011] The following is a summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not intended to identify key or critical elements of the invention or to delineate the scope of the invention. The sole purpose of this section is to present some concepts of the invention in a simplified form as a prelude to the more detailed description that is presented later.

[0012] Because of the above and other reasons known to those of ordinary skill in the art, provided herein are systems and methods for a handgrip for an exercise machine comprising: a first vertical extension, the first vertical extension being an end portion of a moveable arm on an exercise machine, the first vertical extension having a terminating end which does not connect to any other components of the handgrip; a lower horizontal extension, the lower horizontal extension extending outward, downward, and backward from a point between ends of the first vertical extension, an angle of connection of the lower horizontal extension to the first vertical extension being less than 90 degrees; a lower curved portion, the lower curved portion extending the lower horizontal extension into a second vertical extension extending upward from the lower horizontal extension; and an upper curved portion, the upper curved portion extending the second vertical extension into a second horizontal extension, the second horizontal extension extending inward from the second vertical extension and having a terminating end which does not connect to any other components of the handgrip.

[0013] In an embodiment of this handgrip, the lower horizontal extension, the lower curved portion, the second vertical extension, the upper curved portion, and the second horizontal extension are generally in a “C” shape.

[0014] In an embodiment of this handgrip, the terminating end of the first vertical extension has an endcap placed thereon which may be flared and may include a control panel for the exercise machine.

[0015] In an embodiment of this handgrip, the first vertical extension, the lower horizontal extension, the lower curved portion, the second vertical extension, the upper curved portion,

tion, and the second horizontal extension are in the form of rigid tubes which may have a circular or elliptical cross-sectional shape.

[0016] In an embodiment of this handgrip, the handgrip is at least partially covered with a texture material.

[0017] There is also described herein a handgrip for an exercise machine comprising: an outward curved portion, the outward curved portion being an end portion of a moveable arm on an exercise machine which bends outward and backward from the moveable arm; a lower horizontal extension, the lower horizontal extension extending outward and upward from the outward curved portion; the lower horizontal extension terminating in two curved sections which extend upward and then inward from the lower horizontal extension; a second horizontal extension extending inward from the two curved sections and having a terminating end which does not connect to any other components of the handgrip; and an angle protrusion, extending inward and upward from the lower horizontal extension, the angle protrusion having a terminating end which does not connect to any other components of the handgrip; wherein the angle protrusion extends from the lower horizontal extension at an angle less than 90 degrees.

[0018] In an embodiment of this handgrip, the lower horizontal extension, both the curved portions, and the second horizontal extension are generally in a "C" shape.

[0019] In an embodiment of this handgrip, the terminating end of the second horizontal extension has an endcap placed thereon which may be flared and which may include a control panel for the exercise machine.

[0020] In an embodiment of this handgrip, the outward curved portion, the lower horizontal extension, both the curved portions, and the second horizontal extension are in the form of rigid tubes which may have a circular or elliptical cross-sectional shape.

[0021] In an embodiment of this handgrip, the handgrip is at least partially covered with a texture material.

[0022] There is also described herein, a handgrip for an exercise machine comprising: an outward curved portion, the outward curved portion being an end portion of a moveable arm on an exercise machine which bends outward and backward from the moveable arm; a lower horizontal extension, the lower horizontal extension extending outward and upward from the outward curved portion; the lower horizontal extension terminating in two curved sections which extend upward and then inward from the lower horizontal extension; a second horizontal extension extending inward from the two curved sections and having a terminating end which does not connect to any other components of the handgrip; and an angle protrusion, extending inward and upward from the lower horizontal extension, the angle protrusion into a vertical riser extending upward from the angle protrusion; wherein the vertical riser comprises a terminating end which does not connect to any other components of the handgrip; and wherein the angle protrusion extends from the lower horizontal extension at an angle less than 90 degrees.

[0023] In an embodiment of this handgrip, the lower horizontal extension, both the curved portions, and the second horizontal extension are generally in a "C" shape.

[0024] In an embodiment of this handgrip, the terminating end of the second horizontal extension has an endcap placed thereon which may be flared and which may include a control panel for the exercise machine.

[0025] In an embodiment of this handgrip, the outward curved portion, the lower horizontal extension, both the curved portions, and the second horizontal extension are in the form of rigid tubes which may have a circular or elliptical cross-sectional shape.

[0026] In an embodiment of this handgrip, the handgrip is at least partially covered with a texture material.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] FIG. 1 shows a side view of an elliptical exercise machine with moveable arms.

[0028] FIG. 2 shows a perspective view of a first embodiment of an open handgrip for an arm on a user's left side.

[0029] FIG. 3 shows an alternative perspective view of the embodiment of FIG. 2.

[0030] FIG. 4 show a perspective view of a second embodiment of an open handgrip for an arm on a user's left side.

[0031] FIG. 5 shows an alternative perspective view of the embodiment of FIG. 4.

[0032] FIG. 6 shows the embodiment of the handgrip of FIG. 4 in both left and right side versions.

[0033] FIG. 7 shows a perspective view of a third embodiment of an open handgrip for an arm on a user's left side.

[0034] FIG. 8 shows an alternative perspective view of the embodiment of FIG. 7.

[0035] FIG. 9 shows the embodiment of the handgrip of FIG. 7 in both left and right side versions.

[0036] FIG. 10 show an embodiment of left and right hand button pads.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT(S)

[0037] The following detailed description and disclosure illustrates by way of example and not by way of limitation. This description will clearly enable one skilled in the art to make and use the disclosed structures and methods, and describes several embodiments, adaptations, variations, alternatives and uses of the disclosed structures and methods. As various changes could be made in the above constructions without departing from the scope of the disclosures, it is intended that all matter contained in the description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

[0038] Although the machines, devices, and methods described below are discussed primarily in terms of their use with a particular layout of an elliptical exercise motion machine where a rotational crankshaft is on the back of the machine and the machine provides moving pendulum arms, one of ordinary skill in the art would understand that the principles, methods, and objects discussed herein could be adapted, without undue experimentation, to be useable on any elliptical motion or other exercise machine which generates its motion through the use of any mechanisms.

[0039] FIG. 1 shows an embodiment of a user driven (as opposed to motor driven) cardiovascular exercise machine (109) in the form of an elliptical exerciser. As can be seen in FIG. 1, the user (101) is utilizing his feet and legs to power the footskates (103), onto which his feet are positioned, through the elliptical motion. However, the user (101) is also provided with a number of different exercise arms and handgrips (105) and (107). The first of these are stationary arms (107) and these are primarily used to provide the user with a balance point and support if they do not wish to exercise their upper

body. The second set are moveable arms (105). The moveable arms (105) are much larger than the stationary arms (107) and are designed to move in a motion that is interlinked with the motion of the feet, thus serving as a second drive point for the exercise machine (109). These moveable arms (105) provide for a secondary exercise on the machine (109) by allowing the user to exert force with the arms against the resistance afforded by the machine (109) and the user's (101) own mass.

[0040] The use of moveable arms (105) in exercise machines (109) is relatively common and increasingly popular, but moveable arms (105) often have a number of concerns. In the first instance, moveable arms (105) often need to be quite large so as to accommodate a variety of different sized users and, as a result, the moveable arms (105) often stick up quite high to provide sufficient and comfortable rotation. This means that the range of motion of the moveable arms (105) is often quite large and there is concern that components of the moveable arms (105) can hit a user (101), hit a bystander, or get in the way of the user (101) while exercising.

[0041] A second concern with moveable arms (105) is that the moveable arms (105) often need to provide a variety of handgrip positions in order to provide for a comfortable hand position for the user. Often, the most comfortable position will vary depending on the type of motion, or intensity of exercise, the machine (109) is providing. For example, a more vertical handgrip may be desirable for a machine (109) providing a motion more akin to cross country skiing as ski poles are generally gripped vertically. However, a machine (109) providing a more vertical climbing motion will often provide grips that are more horizontal in order to simulate the rungs on a ladder. For machines (109) that can provide for a variety of different motions, such as the one depicted in FIG. 1, this can mean there is a need to provide for a moveable arm (105) with a structure to provide for a large number of potentially different grip locations.

[0042] Another problem with traditional handgrips, particularly when they are on moveable arms (105), is that it is often difficult for a user (101) to let go of the grips during an exercise to perform other actions. Exercise machines (109) have traditionally been controlled by a console (111) which is mounted to face the user (101) at a relatively high position. This allows the user (101) to reach the console (111) before, during, and after exercising to observe feedback from monitors in the machine (109) (such as, but not limited to, the distance travelled) as well as to alter specifics of the exercise being performed (such as, but not limited to, its intensity or difficulty). The console (111) also may provide entertainment options, including controls for built in audio or video content or just a simple rack for holding a book or magazine.

[0043] As should be apparent from FIG. 1, when a user (101) is performing a relatively large motion on an exercise machine (109), which is often desirable from a fitness point of view to work large muscles, it can be uncomfortable for them to reach out and interact with the console (111). If one examines the user (101) of FIG. 1, it should be apparent that it would be difficult for him to reach out with his left hand at the instant shown and touch the console (111). Not only can it be uncomfortable, but it can be unbalancing. As a user (101) will generally not wish to stop and start the exercise motion every time they wish to adjust the exercise's difficulty, they are often forced to interact with the console (111) while trying to keep the exercise motion going. As should be apparent from the user's position in FIG. 1, this can be highly unbalancing

depending on how quickly they can interact with the console (111) and how fast the user operating the machine (109).

[0044] The grips, arms, and methods described herein are discussed primarily in terms of their use with a particular layout of an elliptical exercise machine (109), such as that shown in FIG. 1. While the various arms, grips, and methods are particularly useful for an exercise machine (109), such as the one depicted do to its relatively large range of motion, one of ordinary skill in the art would understand that the principles, methods, and machines discussed herein could be adapted, without undue experimentation, to be useable on other elliptical motion machines as well as treadmills, stair steppers, and a wide variety of other cardiovascular machines which utilize movable exercise arms.

[0045] FIGS. 2 and 3 depict a first embodiment of an exercise arm (201) including a handgrip (203) which is useable as a part of an exercise machine (109). The handgrip (203) in FIGS. 2 and 3 provides for onboard controls and an "open" structure which can provide for improved comfort and a better variety of grip locations. Both FIGS. 2 and 3 show the embodiment of the arm (201) for the left side of a user's (101) body and a handgrip (203) that would traditionally be gripped by the user's (101) left hand. A mating arm (201) designed to be used on the right side of the user's body would generally be a mirror image of the arm (201) shown in FIGS. 2 and 3 in the same manner as is illustrated for the alternative embodiments in FIGS. 6 and 9.

[0046] The structure of the arm (201) is such that it provides an upright (211) which is effectively the portion which would generally interconnect the arm (201) at its axis of rotation (113) to the machine (109). In the depicted embodiment of FIG. 1, the axis of rotation (113) is located at around waist height of a user exercising on the machine (109). This is by no means required and the upright (211) may connect to the exercise device (109) at any position appropriate for the exercise being performed on the machine (109). In some embodiments, the axis of rotation (113) may even be moveable or adjustable. Because of this, the upright (211) will generally be of indefinite length dependent on the specifics of the machine (109). However, the length will generally be determined so as to extend the arm (201) from the axis of rotation (113) to a position to place the handgrip (203) at a good height to be grasped by a user (101).

[0047] The upright (211) will generally be a rigid tube, often constructed of metal or strong plastics. The upright (211) tube will generally have a circular or elliptical cross section so as to eliminate sharp corners and provide for a smoother surface, but this is by no means required. In some embodiments, the upright (211) may be relatively linear, however, in others the upright (211) may comprise a curve or bend to provide for a desirable shape and position the handgrip (203) where desired. Generally, the center longitudinal axis of the upright (211) will be arranged so as to be within a single plane (e.g. the tube is "planar").

[0048] It should be apparent from FIG. 1 that it is generally desirable for the upright (211) to be generally planar. Each of the moveable arms (105) will generally move in a fixed planar arc generally mirroring the arc of the other arm (105). Further, these arcs will generally be about perpendicular to the plane of the user's (109) torso. Most human users (101), when they move their arms while walking, will move their arms in this type of pattern, thus, movement of the arms (105) to mimic that pattern is desirable.

[0049] It should be clear from FIG. 1 that in order to keep the danger of the arms (105) hitting the user (109) during exercising to a minimum, particularly if the user (101) is not using them, it is desirable to keep most of the structure outside the upright (211) and away from the user (101). However, this need for outward components is balanced against having to have the user (101) extend their arms unnaturally far to their sides.

[0050] For purposes of this disclosure, terms such as “inward”, “outward”, “upward” and “downward” are used to contemplate relative positions of components. These terms are used since structures in the arm (105) on one side of the machine (109) are generally mirrored to the arm (105) on the opposing side. Thus, it is not possible to absolutely describe the relationship of the pieces on any one arm (105) as it would only be specific to the arm (105) for the specific side with the other side being a mirror image. Further, structurally, the two arms (105) could generally be interchangeable. While doing so would likely render the machine (109) unusable for the standard user, there may be situations where a left arm is placed on the right and vice versa. Thus, this disclosure uses language of relative positioning for improved clarity.

[0051] As used herein “inward” means that assuming the upright (211) moves in a plane generally perpendicular to the torso of the user (101) which is positioned generally to one side of the user (101). Thus, something extending “inward” will extend out from the plane in a direction toward the opposing side of the machine (109) (across the user’s torso). Similarly, the term “outward” is opposite to “inward” and means an extension out from the plane in a direction away from the opposing arm (105). The term “upward” as used herein means generally the vertical direction from the axis (113) to the highest point of the arm (105). “Downward” would mean the opposite of “upward.” Finally, “forward” will generally be the direction that a user (101) exercising on the machine (109) will push the arm (105) and “backward” or “rearward” will generally mean the direction the user (101) will pull the arm (105). Further, the use of any one term is not exclusive to the possibility that a component could not extend in other directions. Thus, a component indicated to extend inward, would extend inward but may also extend forward, backward, or neither. Further, a component indicated to extend inward could also extend upward, downward or neither.

[0052] In the depicted embodiment of FIGS. 2 and 3, the upright (211) has a lower horizontal extension (231) and terminates in a first vertical extension (213). The lower horizontal extension (231) is positioned at the base of the first vertical extension (213) at the top of the upright (211). As should be apparent from FIGS. 2 and 3, the first vertical extension (213) is effectively simply the end portion of the upright (211), however the first vertical extension (213) is called out separately here to show that it is part of handgrip (203) and is generally positioned so as to allow the top of the upright (211) to be grasped by a user (101).

[0053] The grasping of the first vertical extension (213) will generally be accomplished by the user (101) in a traditional vertical “mug-type” grip where the user will wrap their fingers around the first vertical extension (213). The grasping would traditionally have them wrap their thumb in an opposing direction around the first vertical extension (213). In the depicted embodiment of FIGS. 2 and 3 which show a left hand grip, the fingers would thus go to the left of the first vertical extension (213) and their thumb would go to the right.

[0054] However, as is shown in the depicted embodiment, the first vertical extension (213) has a terminating end (215) and does not connect with the other components to form a closed loop. This is commonly referred to herein as a “open” structure as this provides for a handgrip (203) which does not circumscribe an area. It only partially circumscribes an area and creates a structure with two terminating ends on each handle (105). Because of this structure, the user (101) need not wrap their thumb around the first vertical portion (213), but may instead place it on top of the terminating end (215).

[0055] The terminating end (215) of FIGS. 2 and 3 is covered by an end cap (217) which in the embodiment of FIG. 2 is flared in a trumpet or horn shape. This provides that the end (215) is actually wider than the cross section of the first vertical extension (213) and then smoothly tapers down to a portion (227) which covers the end of the first vertical extension (213). This end (215) is generally also not in a plane perpendicular to the length of the first vertical section (213) (not co-planar with the cross sectional area). This provides that the area (219) of the end (215) is generally greater than the cross sectional area of the upright (211). While it is not required, this shape of end cap (217) provides for a smooth grasping surface without sharp corners which can be more comfortable for the user’s (101) hands. It also provides for a more natural stop as the end cap (217) flares and inhibits the user (101) from sliding their hands (particularly their wrapped fingers) over the end (215) of the first vertical extension (213).

[0056] Upon the area (219) there will commonly be placed a control panel (291A) or (291B). The control panel (291A) or (291B) is essentially a small button pad duplicating some of the controls available on the console (111) and will often comprise a touch screen or button surface which allows for buttons or other activation objects to be placed thereon. An embodiment of two button pads (291A) and (291B) are shown in FIG. 10. As should be apparent, placing control panel (291A) or (291B) on the area (219) allows for a user (101) to activate the buttons (293) on the panel (291A) or (291B) with their thumb in a very natural position as the thumb will, commonly be desired to rest on area (219). The buttons (293) will generally be a form of simplified controls and may include items to alter the exercise’s difficulty (e.g. speed or incline) as shown in panel (291A), buttons to stop the machine (109) in an emergency, buttons to alter a user’s stride length as shown in panel (291B), or buttons to control comfort features such as audio volume.

[0057] In the embodiment of FIG. 10, the panel (291A) would be used on the left arm (105) depicted in FIG. 2 and the panel (291B) would be used on the right arm (105). The advantage of positioning buttons on the area (219) is that it is a very natural position to place the thumb and it allows the user to operate major functions of the exercise machine (109) while still gripping the vertical extension portion (213) and without having to release the handgrip (203) and risk losing their balance.

[0058] In the embodiment of FIGS. 2 and 3, the lower horizontal extension (231) extends outward and backward from the upright (211) as shown in FIG. 2. The lower horizontal extension (231) will also generally not extend from the upright (211) in a perpendicular fashion, but will angle downward so the angle A is less than 90 degrees. While this is not required, the connection point where angle A is formed, if it is an acute angle, effectively forms a pinch point (233) for the

thumb if the hand is wrapped over the lower horizontal extension (231) and the thumb is tucked into the corner (233).

[0059] The pinch point (233) means that the user (101) is generally discouraged from grasping the lower horizontal extension (231) in the manner of grasping a bike handlebar right at the corner (233). Instead, because of the pinch point (233), the user (101) will generally rotate their thumb and have their thumb wrap around the upright (211) right around the transition point to the first vertical extension (213). This is a more natural position of the hand, and inhibits the user from grasping the lower horizontal extension (231) too hard, which can result in them putting too much weight on it and not getting a full exercise benefit.

[0060] As one continues around the lower horizontal extension (231), it converts into a lower curved portion (241), a second vertical extension (251), an upper curved portion (261), and then a second horizontal extension (271). As can be seen, these are arranged to form a generally “C” shape for the left handgrip (203) of FIG. 2. It would be an inverted “C” shape for the right. This arrangement provides for two additional natural gripping locations in the form of the second vertical extension (251) and the upper horizontal section (271). It should also be recognized that certain users would want to grasp the curved portions (241) and (261).

[0061] The primary advantage of having natural handgrip positions on the second vertical extension (251) and the upper horizontal section (271) is that these positions allow a user (101) that is larger (e.g. wider and/or taller) to grip the handgrip (203) at a position further from their body either outward or upward, depending on the type of grip desired and different from that which can be obtained from the first vertical extension (213) or lower horizontal extension (231). In order to enhance the feel, the handgrip (203) may be coated with a textured or rubberized surface as is known to those of ordinary skill in the art.

[0062] It should be apparent from FIGS. 2 and 3 that the structure of the handgrip (203) is open. That is, there are two ends (215) and (275) formed in the handgrip (203). In FIGS. 2 and 3, the end cap (217) is located on the end (215) of the first vertical extension (213) and the end (275) is simply closed and covered with the texture material as shown in FIG. 3. This is, however, not required, and in an alternative embodiment the end (275) of the upper horizontal extension (271) could additionally or alternatively include an end cap (217).

[0063] It should be clear from the above that there are a number of benefits of including two ends (215) and (275) in the handgrip (203) through the inclusion of an open structure. It is often comfortable for a user to grasp a tube in the handgrip (203) with their thumb over an end. Biomechanics of the human hand generally place the thumb to the inside of the index finger when the fingers are curled, not below it as is the case when grasping a tube. Grasping of a tubular grip between its ends at a position where its end is not within reach of the thumb, the thumb is generally positioned downward (as opposed to inward) of the index finger. Having ends (215) and (275) be available for the thumb to go over, therefore, provides a more natural position as the thumb can go over the end (215) or (275) with the fingers placed on top of the tube, or on an appropriate side.

[0064] FIGS. 4-6 provide for a second embodiment of an open handgrip (403). As in the embodiment of FIGS. 2-3, the arm (105) again includes an upright (211) serving to interconnect the handgrip (230) to the axis of rotation (113).

However, in the embodiment of FIGS. 4-6, the upright (211) terminates in an outward curved portion (423) which will bend generally outward and backward of the upright (211). There is no first vertical extension (213) present and, the lower horizontal extension (431) extends outward and generally upward. The lower horizontal extension (431) terminates in two curved sections (441) and (461) which then have a second horizontal extension (471) present thereon. As should be apparent, the structure of FIGS. 4-6 does not actually have any vertical extensions, but is focused on horizontal extensions (431) and (471) and curved portions (423), (441), and (461). The embodiment of FIGS. 4-6 is again a “C” type shape (standard for the left side and inverted for the right as can be seen in FIG. 6).

[0065] Instead of first vertical extension (213), the embodiment of FIGS. 4-6 provides for an additional grip portion in the faun of angle protrusion (413) which extends from the lower horizontal extension (431) upward and inward. This projection (413) is generally not vertically arranged, but is generally arranged more vertically (and in opposing direction—inwardly in the FIGS.) compared to the lower horizontal extension (431). The projection (413) in FIGS. 4-6 is also positioned more vertically than the upper horizontal extension (471), but that is by no means required. As shown in FIGS. 4-6, the end cap (217) in this embodiment (along with the control panel (291A)) is positioned on the end (475) of the upper horizontal extension (471). However, this is by no means required and it may be positioned additionally or alternatively on the end (415) of the projection (413).

[0066] FIGS. 7-9 provide for a third embodiment of an open handgrip (703). This embodiment is generally of very similar design to the second embodiment of FIGS. 4-6, including the same components of the upright (211), outward curve (423), first horizontal extension (431), first and second curved portions (441) and (461), the second horizontal extension (475) and projection (413) in essentially the same arrangement. However, this embodiment adds a vertical riser (713) to the end (415) of the projection (413) to produce a more vertical gripping section (713) and associated terminal end (715). As should be apparent from FIGS. 7-9, the vertical riser (713) may be close to co-planar, co-planar, or even co-linear with the upright (211). If the upright (211) and vertical riser (713) are co-planar, this essentially places the vertical riser (713) in a position equivalent to the first vertical extension (213) of the embodiment of FIGS. 2-3. The embodiment of FIGS. 7-9 is, therefore, in some respects, a combination of elements of the first two embodiments which provides a slightly more complicated shape.

[0067] As can be best seen in FIGS. 8-9, the end cap (217) in this embodiment, like in the embodiment of FIGS. 4-6, is positioned on the end (475) of the upper horizontal extension (471) instead of on the end (715) of the vertical riser (713). However, as in all the prior embodiments, the end cap (217) can be placed on either or both of ends (475) and (715).

[0068] In all the above embodiments, the handgrip has two terminating ends that do not connect with the other components to form a closed loop but instead form an open loop in the form of a “C”, inverted “C”, “U”, or inverted “U” depending on the side of the exercise machine the grip is to be used on and the manner of viewing it. This is referred to herein as having an open structure as this provides for a handgrip which does not fully circumscribe an area. It only partially circumscribes an area and creates a structure with two terminating ends on each handle.

[0069] While the invention has been disclosed in connection with certain preferred embodiments, this should not be taken as a limitation to all of the provided details. Modifications and variations of the described embodiments may be made without departing from the spirit and scope of the invention, and other embodiments should be understood to be encompassed in the present disclosure as would be understood by those of ordinary skill in the art.

1. A handgrip for an exercise machine comprising:
 - a first vertical extension, said first vertical extension being an end portion of a moveable arm on an exercise machine, said first vertical extension having a terminating end which does not connect to any other components of said handgrip;
 - a lower horizontal extension, said lower horizontal extension extending outward, downward, and backward from a point between ends of said first vertical extension, an angle of connection of said lower horizontal extension to said first vertical extension being less than 90 degrees;
 - a lower curved portion, said lower curved portion extending said lower horizontal extension into a second vertical extension extending upward from said lower horizontal extension; and
 - an upper curved portion, said upper curved portion extending said second vertical extension into a second horizontal extension, said second horizontal extension extending inward from said second vertical extension and having a terminating end which does not connect to any other components of said handgrip.
2. The handgrip of claim 1 wherein said lower horizontal extension, said lower curved portion, said second vertical extension, said upper curved portion, and said second horizontal extension are generally in a "C" shape.
3. The handgrip of claim 1 wherein said terminating end of said first vertical extension has an endcap placed thereon.
4. The handgrip of claim 3 wherein said endcap is flared.
5. The handgrip of claim 3 wherein said endcap includes a control panel for said exercise machine.
6. The handgrip of claim 1 wherein said first vertical extension, said lower horizontal extension, said lower curved portion, said second vertical extension, said upper curved portion, and said second horizontal extension are in the form of rigid tubes.
7. The handgrip of claim 6 wherein said rigid tubes have a circular or elliptical cross-sectional shape.
8. The handgrip of claim 1 wherein said handgrip is at least partially covered with a texture material.
9. A handgrip for an exercise machine comprising:
 - an outward curved portion, said outward curved portion being an end portion of a moveable arm on an exercise machine which bends outward and backward from said moveable arm;
 - a lower horizontal extension, said lower horizontal extension extending outward and upward from said outward curved portion, said lower horizontal extension terminating in two curved sections which extend upward and then inward from said lower horizontal extension;
 - a second horizontal extension extending inward from said two curved sections and having a terminating end which does not connect to any other components of said handgrip; and
 - an angle protrusion, extending inward and upward from said lower horizontal extension, said angle protrusion

having a terminating end which does not connect to any other components of said handgrip;
 wherein said angle protrusion extends from said lower horizontal extension at an angle less than 90 degrees.

10. The handgrip of claim 9 wherein said lower horizontal extension, both said curved portions, and said second horizontal extension are generally in a "C" shape.

11. The handgrip of claim 9 wherein said terminating end of said second horizontal extension has an endcap placed thereon.

12. The handgrip of claim 11 wherein said endcap is flared.

13. The handgrip of claim 11 wherein said endcap includes a control panel for said exercise machine.

14. The handgrip of claim 9 wherein said outward curved portion, said lower horizontal extension, both said curved portions, and said second horizontal extension are in the form of rigid tubes.

15. The handgrip of claim 14 wherein said rigid tubes have a circular or elliptical cross-sectional shape.

16. The handgrip of claim 9 wherein said handgrip is at least partially covered with a texture material.

17. A handgrip for an exercise machine comprising:

an outward curved portion, said outward curved portion being an end portion of a moveable arm on an exercise machine which bends outward and backward from said moveable arm;

a lower horizontal extension, said lower horizontal extension extending outward and upward from said outward curved portion, said lower horizontal extension terminating in two curved sections which extend upward and then inward from said lower horizontal extension;

a second horizontal extension extending inward from said two curved sections and having a terminating end which does not connect to any other components of said handgrip; and

an angle protrusion, extending inward and upward from said lower horizontal extension, said angle protrusion into a vertical riser extending upward from said angle protrusion;

wherein said vertical riser comprises a terminating end which does not connect to any other components of said handgrip; and

wherein said angle protrusion extends from said lower horizontal extension at an angle less than 90 degrees.

18. The handgrip of claim 17 wherein said lower horizontal extension, both said curved portions, and said second horizontal extension are generally in a "C" shape.

19. The handgrip of claim 17 wherein said terminating end of said second horizontal extension has an endcap placed thereon.

20. The handgrip of claim 19 wherein said endcap is flared.

21. The handgrip of claim 19 wherein said endcap includes a control panel for said exercise machine.

22. The handgrip of claim 17 wherein said outward curved portion, said lower horizontal extension, both said curved portions, and said second horizontal extension are in the form of rigid tubes.

23. The handgrip of claim 22 wherein said rigid tubes have a circular or elliptical cross-sectional shape.

24. The handgrip of claim 17 wherein said handgrip is at least partially covered with a texture material.